AQA

PRACTICE PAPER SET 3

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname WRITTEN SOLUTIONS

Forename(s)

Candidate signature

GCSE MATHEMATICS

F

Foundation Tier Paper 1 Non-Calculator

Date of Exam Morning Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:
- mathematical instruments.

You must **not** use a calculator.

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

Advice
- In all calculations, show clearly how you work out your answer.

Answer **all** questions in the spaces provided.

1 What is $\frac{9}{10}$ as a percentage?

Circle your answer.

[1 mark]

0.09% 0.9% 9% (90%)

2 Which one of these numbers is a multiple of 12?

Circle your answer.

[1 mark]

(72) 74 76 78

(6x12=72)

3 What name is given to the **most frequent** item in a list?

Circle your answer. ↳most common

[1 mark]

mean median (mode) range

4 Convert 2.5 metres into centimetres. ×2.5 (1M = 100cm, 2.5M = 250cm) ×2.5

Circle your answer.

[1 mark]

0.025 cm 25 cm 205 cm 250 cm

5 Work out 7152 + 876 – 139

[2 marks]

$$\begin{array}{r} 7152 \\ +\ 876 \\ \hline 8028 \end{array}$$

$$\begin{array}{r} 7\,\overset{9}{\cancel{8}}\,\overset{11}{\cancel{0}}\,\overset{1}{\cancel{2}}\,8 \\ -\ 139 \\ \hline 7889 \end{array}$$

Answer 7889

Turn over for the next question

6 The first part of a show starts at 7.45 pm

It lasts 35 minutes.

6 (a) What time does the first part end?

[1 mark]

7·45pm + 35 mins = 8·20pm

Answer 8·20pm

6 (b) After the first part there is a 20-minute break.

The **second** part lasts 45 minutes.

What time does the second part end?

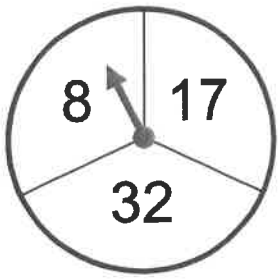
[2 marks]

break ⇒ 8·20pm + 20 mins = 8·40pm

2nd part ⇒ 8·40pm + 45 mins = 9·25pm

Answer 9·25pm

7 A game is played with a fair spinner.



The player spins the spinner twice.

The player adds the two numbers to get the score.

7 (a) Complete the table to show the possible scores.

[2 marks]

		First spin		
		8	**17**	**32**
Second spin	**8**	16 ✓	25 ✓	40
	17	25 ✓	34	49 ✓
	32	40	49 ✓	64 ✓

7 (b) Work out the probability that the score is a **square** number.

[2 marks]

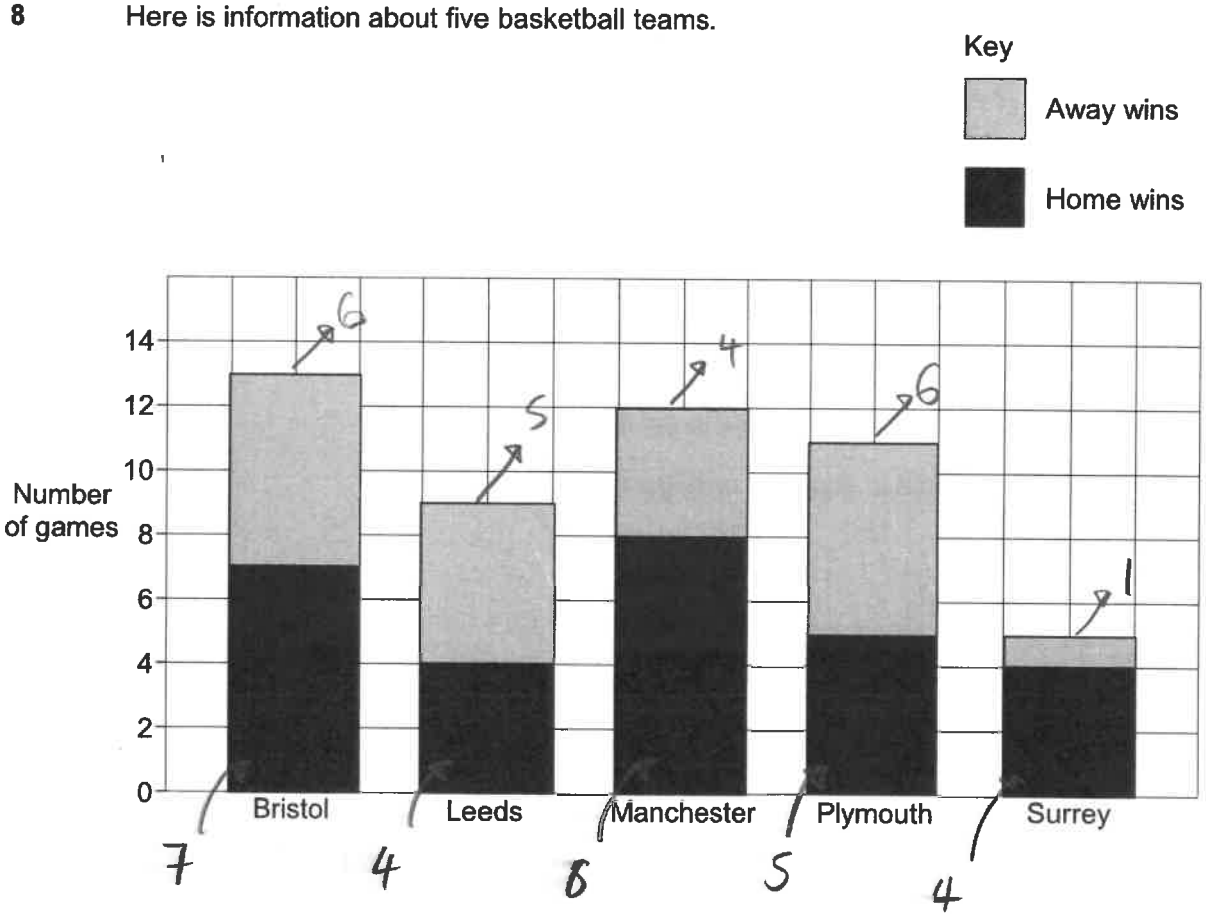
1x1 2x2 3x3 4x4 5x5 6x6 7x7 8x8

Square numbers (1) (4) (9) (16) (25) (36) (49) (64)

So 6 are square numbers

Answer $\frac{6}{9} = \frac{2}{3}$

8 Here is information about five basketball teams.



8 (a) Which team had the most **home** wins?

[1 mark]

Answer Manchester

8 (b) Which **two** teams had the same number of away wins?

[1 mark]

(See working above!)

Answer Bristol and Plymouth

8 (c) How many **more** home wins than away wins were there altogether?

[3 marks]

* Home wins = 7 + 4 + 8 + 5 + 4 = 28

* Away wins = 6 + 5 + 4 + 6 + 1 = 22

28 − 22 = 6

Answer 6

9 (a) Solve $x + 12 = 29$ (−12)

[1 mark]

x = 17

$x =$ x = 17

9 (b) Solve $0.5y = 20$ (÷ 0.5)

$\frac{20}{0.5} = \frac{40}{1} = 40$ (×2 on both)

[1 mark]

y = 40

$y =$ y = 40

10 Boxes cost £2.40 each.

You can use this table to work out the cost of different numbers of boxes.

Number of boxes	1	2	5	10
Cost	£2.40	£4.80	£12	£24

10 (a) Work out the cost of 3 boxes. (1 + 2 = 3)

[2 marks]

2·40
+ 4·80
7·20

Answer £ 7·20

10 (b) Ethan pays £52.80 for some of these boxes.

Work out the number of boxes he buys.

[2 marks]

2 boxes
52·80 − 4·80 = £48·00
£48·00 − £24 = £24 ← 10 boxes
10 boxes

Answer 10 + 10 + 2 = 22 boxes

10 (c) Use the table to write £9.60 : £12 as a ratio in its simplest form.

[1 mark]

÷2·40 ÷2·40
4 : 5

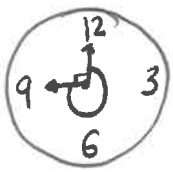
Answer 4 : 5

11 How many degrees does the **hour** hand on a clock turn in 9 hours?

Circle your answer.

[1 mark]

45° 270° 540° 3240°



12 What fraction of $1\frac{1}{4}$ is $\frac{1}{8}$?

Circle your answer.

[1 mark]

$\frac{1}{32}$ $\frac{1}{10}$ $\frac{1}{6}$ $\frac{1}{4}$

$1\frac{1}{4} = \frac{5}{4}$ $\frac{1}{8}$ goes into $\frac{1}{4}$ twice, so we have $\frac{5}{4}$ so // $5 \times 2 = 10$

As $\frac{1}{8}$ goes into $\frac{5}{4}$ 10 times, $\frac{1}{8}$ is $\frac{1}{10}$ of $\frac{5}{4}$

13 A point lies on the graph with equation $y = x^2 + x$

The x-coordinate of the point is –3

Circle the coordinates of the point.

[1 mark]

(–3, –12) (–3, –6) (–3, 6) (–3, 12)

$x = -3$

$y = (-3)^2 + -3$

$y = 9 + -3 = 6$

Turn over for the next question

$(-3)^2 = -3 \times -3 = 9$

Do not write outside the box

14 Is 30×445 greater than 15×900?

Give a reason for your answer.

[2 marks]

Tick a box

Yes ☐ No ☑

Reason 30 x 445 15x900

x2 (15x900 / 30x445) Not ÷ by 2

X.

445 is less than half of 900 so 15x900 will give a bigger answer.

15 Rearrange $p = r + 3$ (-3) to make r the subject.

Circle your answer.

p-3=r or r=p-3

[1 mark]

$r = p + 3$ $r = p - 3$ $r = 3 - p$ $r = \frac{p}{3}$

16 (a) Work out $\frac{1}{4} + \frac{7}{10}$

Give your answer as a fraction.

[2 marks]

$\frac{1}{4} + \frac{7}{10} = \frac{5}{20} + \frac{14}{20} = \frac{19}{20}$

(×5 and ×2 to make the denominators 20)

Answer $\frac{19}{20}$

16 (b) Work out $3\frac{1}{5} \times 7\frac{1}{2}$

Give your answer as a mixed number.

[2 marks]

$3\frac{1}{5} \times 7\frac{1}{2} = \frac{21}{10} = 2\frac{1}{10}$

How many 10s go into 21?

Answer $2\frac{1}{10}$

17 A shopkeeper uses this formula to work out the cost of bags of oranges.

$C = 1.8n$

C is the cost in £

n is the number of bags

17 (a) Work out the cost of 7 bags.

[2 marks]

$C = 1.8 \times 7$

$$\begin{array}{r} 1.8 \\ \times \quad 7 \\ \hline 12.6 \end{array}$$

Answer £ 12.60

17 (b) There are four oranges in each bag.

Work out the average cost of an orange.

Give your answer in pence.

[2 marks]

$1.80 \div 4$

$$4 \overline{)1.80} = 0.45$$

Answer 45p pence

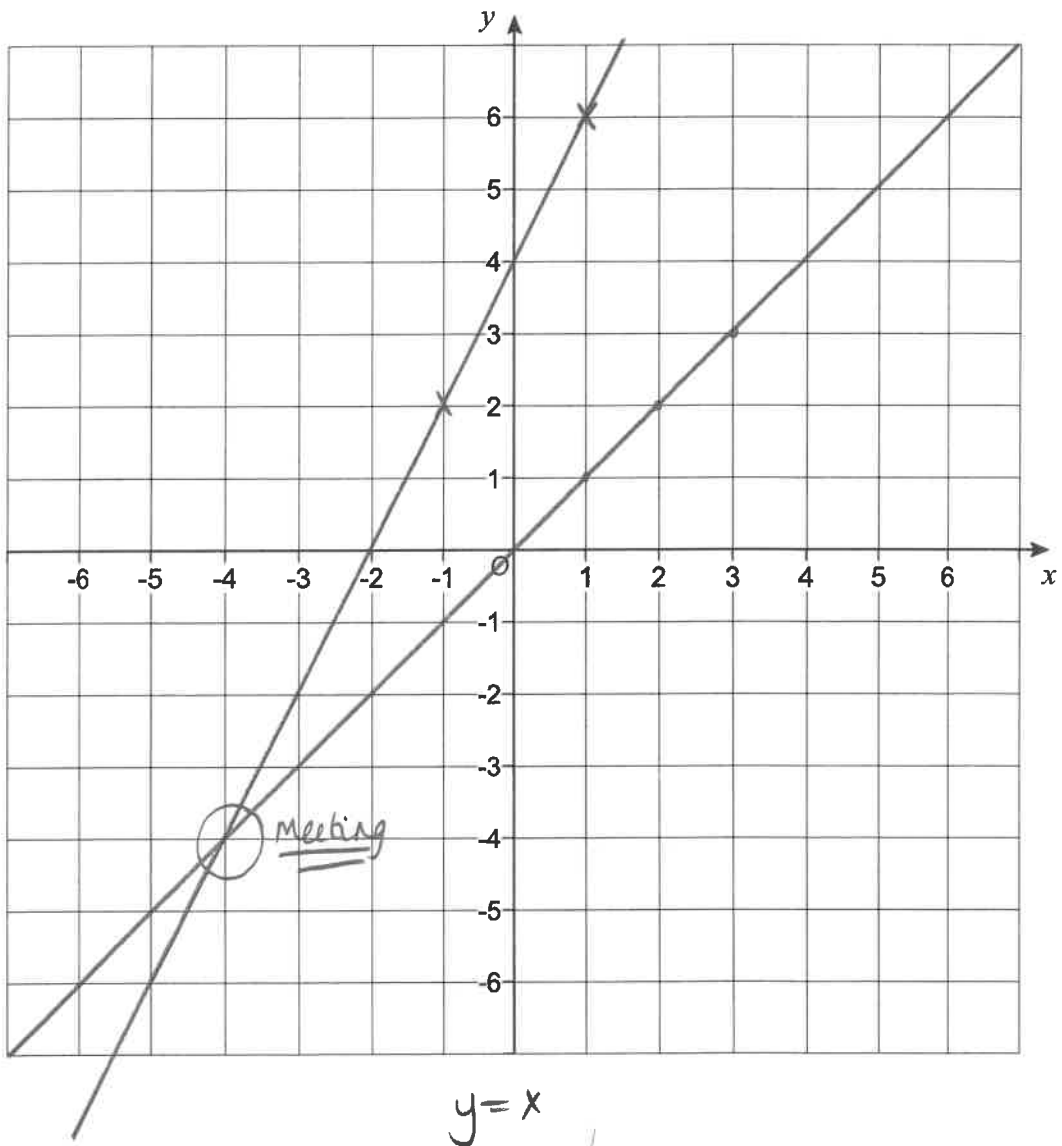
18 A straight line passes through the points (–1, 2) and (1, 6)

Another straight line has equation $y = x$

Work out the coordinates of the point of intersection of the two lines.

You may use the grid to help you.

[4 marks]



$y = x$

x	1	2	3
y	1	2	3
	(1,1)	(2,2)	(3,3)

Answer (−4 , −4)

19 Ajit is a barber.

He charges £5 for a haircut.

He charges 10% extra for hair gel.

One day 52 customers have a haircut.

16 of these ask for hair gel.

Work out the **total** amount that Ajit charges his customers that day.

[5 marks]

52 − 16 = 36

36 customers - no gel = £180

16 customers - with gel =

36 × 5 = £180

30 × 5 = 150

6 × 5 = 30

16 × 5 = £80 Need to add on 10%

10 × 5 = 50

6 × 5 = 30

10% of £80 is £8

£80 + £8 = £88

Total 180 + 88 = £268

180
+ 88
268

Answer £ 268

20 By rounding each number to 1 significant figure, estimate the answer to

$$\frac{78 \times 11.6}{391}$$

80 → 78 → 80 to 1sf
11.6 → 10 to 1sf
391 → 400 to 1sf

$$\frac{80 \times 10}{400} = \frac{800}{400} = 2$$

You **must** show your working.

[3 marks]

Answer 2

21 Solve $\frac{x}{3} - 9 = 12$

$\frac{x}{3} = 19$ (+9) (×3)

$x = 57$

[2 marks]

$x =$ $x = 57$

22 At a lucky dip stall, players pick a ball at random from a tub and then replace it.

The tub contains 250 red balls
230 yellow balls
120 green balls.

Emma has 15 picks.

22 (a) What is the probability that Emma wins a prize with her first pick?

[2 marks]

$250 + 230 + 120 = 600$

So // $P(\text{winning}) = \frac{120}{600} = \frac{1}{5}$

Answer $\frac{1}{5}$

22 (b) With her 15 picks, Emma wins 4 prizes.

Is this **more** than the expected number?
You **must** show your working.

[2 marks]

$\frac{1}{5}$ of 15 = 3

So we would expect Emma to win 3 prizes, so 4 is more.

Answer

23 The air pressure in a tyre measures 7.2 bar.
Air is leaking out at the rate of 0.2 bar per day.

23 (a) Assume that the air continues to leak at the same rate.

After how many days will the pressure measure 4.8 bar?

[2 marks]

$7.2 - 4.8 = 2.4$

$2.4 \div 0.2 = 12$

$\frac{2.4}{0.2} = \frac{12}{1} = 12$ (×5)

Answer

23 (b) In fact, the rate that the air leaks out increases each day.

How does this affect your answer to part (a)?

[1 mark]

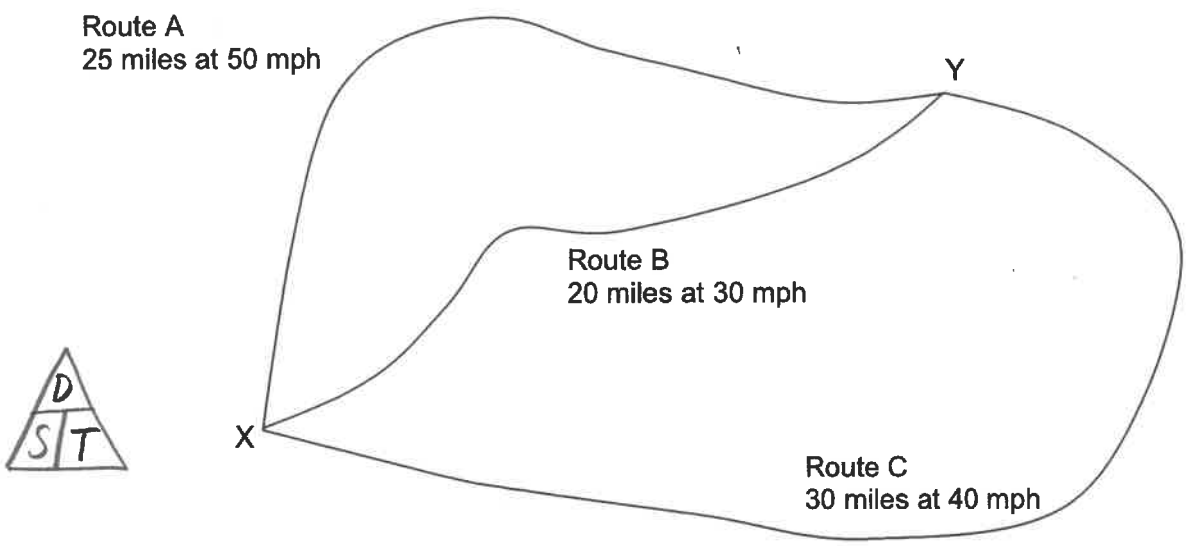
If the rate at which the air leaks is increasing it will take less days for the pressure to reach 4.8 bar.

Turn over for the next question

24 The diagram shows three routes, A, B and C, between two towns, X and Y.

The distance and average speed for each route is shown.

Not drawn accurately



Distance ÷ speed = time

24 (a) Which of the three routes takes the longest time?

Assume the average speeds given.

You **must** show your working.

[4 marks]

★ Route A ⇒ 25 ÷ 50 = 0.5 hours
= 30 mins

★ Route B ⇒ 20 ÷ 30 = $\frac{2}{3}$ of an hour
= 40 mins

★ Route C ⇒ 30 ÷ 40 = $\frac{3}{4}$ of an hour
= 45 mins

So route C takes the longest time.

Answer Route C

24 (b) Jon and Matt take the same time to travel from X to Y.

Jon travels along route B at 10 mph **faster** than the average speed.

Matt travels along route C.

Does Matt travel faster or slower than the average speed for route C, and by how much?

You **must** show your working.

[3 marks]

* Route B at 10mph faster is 20 miles @ 40mph $20 \div 40 = 0.5$ hours $= 30$ mins
* Route C currently takes 45 mins to get to Y so Matt must travel faster. To make the journey in half an hour he must cover 30 miles in half an hour, so travels at 60mph. ($30 \div 60 = 0.5$ hours $= 30$ mins)

Which is 20 mph faster ($60 - 40 = 20$)

Tick a box.

Faster [✓] Slower [ ]

Answer 20mph mph

25 (a) Here are the fourth and fifth terms of a Fibonacci-type sequence.

2 13 15 28 43

Each term is the sum of the previous two terms.

Show that the first term is 2

[2 marks]

43 − 28 = 15
28 − 15 = 13
15 − 13 = 2

A Fibonacci type sequence is where the 2 previous terms add up to the next term ie// 2+13=15
13+15=28
etc

25 (b) Here are the first and third terms of a different Fibonacci-type sequence.

a b

Each term is the sum of the previous two terms.

Work out an expression in terms of a and b for the fifth term.

[3 marks]

term ① = a
term ② = $b-a$ (as $a+b-a=b$)
term ③ = b
term ④ = $b+b-a = 2b-a$

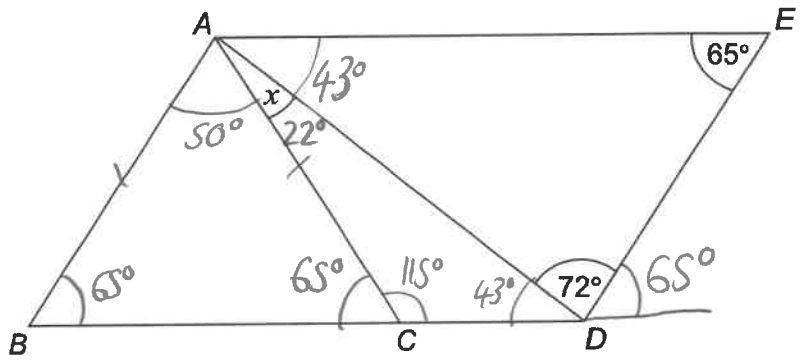
Answer $3b-a$

term ⑤ = $2b-a+b = 3b-a$

26 *ABDE* is a parallelogram.

$AB = AC$

Not drawn accurately



65
+ 72
137
180 − 137 = 43°

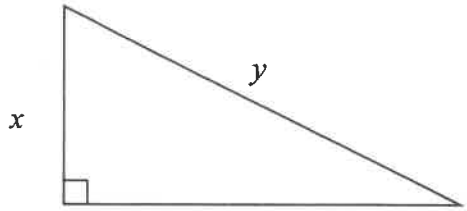
Show that $x = 22°$

[3 marks]

★ Angle ABC is 65° (parallelogram)
★ As AB = AC Angle ACB is 65°
★ Angle BAC is 50° as 180 − 65 − 65 = 50°
★ Angle EAD is 43° as angles in a triangle add up to 180°
★ Angle ADC = 43° as angles on a straight line add up to 180°
★ Angle ACD = 115° as angles on a straight line add up to 180°
★ Angle x is 22° as angles in a triangle add up to 180°.

(NB. Not all reasons are needed here but I wrote everything down to help with marking and corrections)

27 Noah is attempting to work out the base of **different** right-angled triangles.



Not drawn accurately

Here is his method with the working for $y = 10$ and $x = 6$

Work out the value of y^2	$10^2 = 100$
Work out the value of x^2	$6^2 = 36$
Work out the value of $y^2 - x^2$	$100 - 36 = 64$
The base is $\sqrt{y^2 - x^2}$	base $= \sqrt{64}$

(this is a pythagorean triple)

Tick the correct statement.

[3 marks]

☐ The method will **always** give an answer which is a whole number.

☑ The method will **sometimes** give an answer which is a whole number.

☐ The method will **never** give an answer which is a whole number.

Show working to support your answer.

$x = 3$ $y = 10$

$x^2 = 9$ $y^2 = 100$

$100 - 9 = 91$

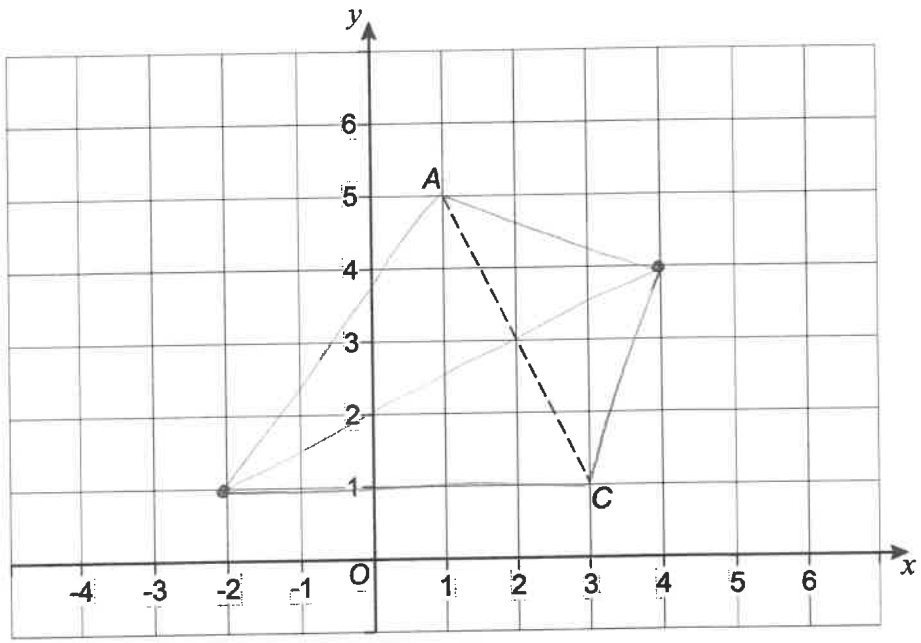
$\sqrt{91}$ is not a whole number.

(need to try and show a non Pythagorean triple).

28 *AC* is a diagonal of kite *ABCD*.

A is the point (1, 5)

C is the point (3, 1)



The diagonals of the kite intersect at *M*, the midpoint of *AC*.

$AM = BM$

$BM : MD = 1 : 2$

Work out possible coordinates for *B* and *D*.

[2 marks]

B(4 , 4) and D(−2 , 1)

or // B(0, 2) and D(6, 5).

END OF QUESTIONS

There are no questions printed on this page

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